

Simulations of Rayleigh-Taylor Growth in Converging Geometry, for NIF and
Nova Implosions*

Steven W. Haan, Thomas R. Dittrich, and George L. Strobel

Lawrence Livermore National Laboratory
University of California
7000 East Avenue, P.O. Box 808
Livermore, CA 94551 USA

Phone: (510)422-4715
Fax: (510)423-9208
E-mail: haan1@llnl.gov

We have done simulations of weakly nonlinear Rayleigh-Taylor growth on a variety of imploding systems relevant to indirect drive inertial confinement fusion. We have simulated backlit Nova implosions that have been done by Glendinning¹ and Kalantar². We present comparison between simulation and experiment for these data, both for 1D parameters (radii and in-flight aspect ratio) and for the growth of imposed perturbations. We have also continued simulations of perturbation growth on possible ignition targets for the National Ignition Facility (NIF). We will present results for perturbations and their effects on several NIF targets. We will review previous results on NIF targets, and show more recent work. Recent results suggest that short wavelength growth (modes 80-100) are likely to be important and will constrain the surface finish requirements for plastic-ablator capsules more than for beryllium or B₄C ablators.

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¹ "Measurements of Rayleigh-Taylor growth in ablatively driven converging hemispherical targets at Nova," by S.G. Glendinning, S.W. Haan, D.H. Kalantar, M.M. Marinak, B.A. Remington, R.J. Wallace (Lawrence Livermore National Laboratory), W. Hsing (Los Alamos National Laboratory), D. Galmiche, A. Richard (CEA, Limeil), W.M. Wood-Vasey (Harvey-Mudd College), and A. Rubenchik (U.C. Davis) poster 6S.17 at Division of Plasma Physics meeting, Nov. 1996.

² "X-ray backlit imaging of indirect drive implosions to measure in-flight capsule aspect ratio and convergent hydrodynamics," by D.H. Kalantar, S.W. Haan, B.A. Hammel, O.L. Landen, C.J. Keane, D.H. Munro (Lawrence Livermore National Laboratory), poster 6S.18 at Division of Plasma Physics meeting, Nov. 1996).